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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,671	09/23/2003	Hiroshi Takei	242831US0	9100

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EXAMINER

ZIMMER, MARC S

ART UNIT PAPER NUMBER

1712

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/667,671

Applicant(s)

TAKEI ET AL.

Examiner

Marc S. Zimmer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 14-19 is/are rejected.
- 7) ☒ Claim(s) 12 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09/23/03</u> . | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11, and 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okami et al., U.S. patent # 6,074,963 in view of Nakamura et al., U.S. patent # 5,652,290 or Toya et al., U.S. patent # 5,021,494. Okami et al. disclose a thermally conductive composite sheet into which a porous reinforcing material layer is inserted. The reinforcing materials are those contemplated in column 3, lines 52-56. It is stated in the paragraph that follows that the reinforcing material layer is preferably located in the middle of the silicone rubber and a product having a structural integrity is formed by a press forming operation carried out at between 50° C and 200° C thereby providing a multilayered product that resembles that contemplated in claim 1. That is, the reinforcing material layer, insofar as it is placed in the middle of the thermally-conductive curable silicone matrix, represents an intermediate layer on which both surfaces are covered with the filled silicone rubber. The general makeup of the addition-curing polysiloxane is outlined in column 4, lines 36-44 with a more comprehensive description of these materials being provided at column 4, line 45 to column 5, line 33. A description of suitable thermally-conductive fillers is disclosed at column 3, lines 4-11 and the recommended amounts correspond to those disclosed by Applicant in claim 16.

Relevant to the present discussion, mention of adhesion promoters is made at column 5, line 52. While it is appreciated that the disclosure of this component is, at best, cursory in nature, its inclusion in the silicone layers is nevertheless obvious. Further, in the absence of any description of the adhesion promoters themselves, one of ordinary skill would turn to the related prior art to ascertain what compounds are conventionally employed in this capacity.

Nakamura and Toya both describe thermally conductive, addition-curable silicone compositions and are, as such, considered to be directed to analogous inventions. Both of these references teach adhesion promoters having one or more of epoxy groups, alkoxy groups, vinyl groups and hydrosilyl groups- Nakamura at column 6, lines 22-35 and Toya at the bottom of column 4/top of column 5- hence the subject matter recited in claims 17 and 19 is deemed obvious.

As for claim 2, the reinforcing layer disclosed in Example 1 has a thickness of 20 microns.

As for claim 4, because the press forming operation is carried out at temperatures as high as 200° C, it is obvious that a reinforcing polymer with a higher melting point than 200° C would be desirable.

As for claim 5, Example 1 states that the reinforcing material is placed at a depth of from 500 to 800 microns from one surface of the silicone rubber sheet. Further, the skilled artisan is capable of determining the optimal dimensions of the cured composite sheet as a matter of routine experimentation and based on the spacing of the components in the electrical device.

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As for claim 15, Okami is silent regarding the particle size of the thermally-conductive filler. Makamura and Toya, on the other hand, both advocate using thermoconductive fillers having a particle size far less than 50 microns. Toya explains in column 3, lines 45-53 that the skilled artisan would not be inclined to depart from the range claimed by Applicant because heat dissipating characteristics are deleteriously affected when particles outside this range (and, in fact, an even smaller range) are employed.

Allowable Subject Matter

Claims 12 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Okami does not contemplate using a peroxide-cured system in lieu of the hydrosilylation-cured silicone elastomer and the prior art does motivate this substitution.

Tsunekawa, U.S. patent # 5,948,515 is cited as being of interest for their disclosure of a composite sheet having a core polyethylene naphthalate sheet and surface silicone elastomer layers that, in one embodiment, may contain thermally-conductive fillers. However, there are *two* intervening layers separating the polyester layer and the silicone elastomer layer. It is the opinion of the Examiner that the claims exclude those composite materials where the thermally-conductive silicone layer is not in direct contact with the heat resistant, electrically insulating resin layer.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc S. Zimmer whose telephone number is 571-272-1096. The examiner can normally be reached on Monday-Friday 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 9, 2005

Marc Zimmer
Marc Zimmer
AU 1712